

1. A device for monitoring an appliance that receives power from a power source, the device comprising:
 - a first coupler that couples the device to the power source;
 - a second coupler that couples the device to the appliance;
- 5 a monitoring circuit connected between the first coupler and the second coupler to monitor power supplied by the source to the appliance; and
 - a communications circuit connected to the monitoring circuit,
 - wherein the monitoring circuit provides data based on the monitored power to the communications circuit.

10

2. The device of claim 1 wherein the communications circuit includes a receiver that receives a signal from the first coupler to control the monitoring circuit.

15

3. The device of claim 1 wherein the communications circuit includes a transceiver that receives a signal from the first coupler to control the monitoring circuit and to transmit monitored power data.

20

4. The device of claim 1 wherein the communications circuit comprises a power line carrier transceiver and a power line driver coupled to the monitoring circuitry and the first coupler.

5. The device of claim 1 wherein the monitoring circuit measures current drawn by the appliance.

25

6. The device of claim 5 wherein the monitoring circuit includes a processor, that determines an operating state of the appliance based on the measured current.

7. The device of claim 5 wherein the monitoring circuit includes a memory that stores the measured current and periodically sends measured current data to the first coupler.

30

8. The device of claim 5 wherein the monitoring circuit includes a memory that stores an electronic signature and a processor that determines an operating state of the appliance based on the electronic signature.

5 9. The device of claim 8 wherein the processor determines an operating state of the appliance and transmits the determined state to the first coupler.

10. The device of claim 1 further comprising a modem connected to the monitoring circuit for transmitting data based on the measured current.

10

11. The device of claim 1 further comprising a radio frequency transmitter connected to the monitoring circuit for transmitting data based on the measured current.

12. The device of claim 1 further comprising a serial port connected to the monitoring circuit to receive data about the appliance.

15

13. The device of claim 1 further comprising a battery, wherein the monitoring circuit receives power from the first coupler and the battery supplies power to the monitoring circuit when power is not received by the first coupler.

20

14. The device of claim 2 further comprising a switch connected to the first coupler wherein the switch is opened in response to the control signal to prevent power from the source from being supplied to the appliance.

25

15. The device of claim 2 further comprising a switch connected to the first coupler to adjust the amount of power received by the appliance in response to the control signal.

16. The device of claim 1 wherein the first coupler comprises a first pin for connection to a live line and a second pin for connection to a neutral line.

30

17. The device of claim 16 further comprising a first power line and a second power line connecting the first and second couplers, wherein the second coupler includes a first slot

connected to the first pin through the first power line and a second slot connected to the second pin through the second power line.

18. A system for monitoring an appliance that receives power from a source, the system

5 comprising:

a power line connected to the source;

a circuit connected to the power line and the appliance to monitor power supplied to the appliance; and

a processor connected to the power line,

10 wherein the circuit sends a signal to the processor through the power line and the signal is based on the power supplied to the appliance.

19. The system of claim 18 wherein the circuit comprises:

a first coupler that couples the circuit to the power line;

15 a second coupler that couples the circuit to the appliance;

a monitoring circuit connected to the first coupler and the second coupler to monitor power supplied by the source to the appliance; and

a communications circuit connected to the monitoring circuit,

wherein the monitoring circuit provides data based on the monitored power to the

20 communications circuit for output to the first coupler.

20. The system of claim 19 wherein the circuit comprises a plug and the first coupler comprises a first pin for connection to a live line and a second pin for connection to a neutral line.

25

21. The system of claim 20 wherein the monitoring circuit further comprises a first power line and a second power line connecting the first and second couplers, and the second coupler comprises a first and second slot, with the first slot connected to the first pin through the first power line and the second slot connected to the second pin through the second power line.

30

22. The system of claim 18 wherein the processor receives signals transmitted on the power line from the circuit and determines a state of operation of the appliance based on the signals.

5 23. The system of claim 18 wherein the circuit includes a receiver for receiving signals sent from the processor on the power line.

24. The system of claim 23 wherein the appliance's operating state is controlled based on the signals sent to the circuit from the processor.

10

25. The system of claim 22 further comprising a connection to a service provider, wherein the processor comprises a control server, that sends signals to the service provider about the operation of the appliance.

15 26. The system of claim 22 further comprising a connection to remote service provider, wherein the processor comprises a gateway, that sends signals to the service provider about the operation of the appliance.

20 27. The system of claim 22 wherein the processor diagnoses the signals to determine if an appliance service.

28. The system of claim 27 further comprising a display wherein the processor sends a message to the display alerting a user if the appliance needs service.

25 29. A device for monitoring an appliance that receives power from a source, the device comprising:

first means for coupling the device to the power source;

second means for coupling the device to the appliance;

means for monitoring power supplied to the appliance; and

30 means for communicating data based on the monitored power received from the monitoring means,

wherein the monitoring means provides the data to the communications means for output to the first coupling means.

30. The device of claim 29 wherein the communications means includes a receiver that
5 receives a signal from the first coupling means to control the monitoring means.

31. The device of claim 29 wherein the communications means includes a transceiver that receives a signal from the first coupling means to control the monitoring means and to transmit monitored power data.

10

32. The device of claim 29 wherein the monitoring means measures current drawn by the appliance.

15

33. The device of claim 29 wherein the monitoring means determines power used by the appliance.

34. The device of claim 29 wherein the monitoring means determines an operating state of the appliance based on the power used by the appliance.

20

35. The device of claim 29 further comprising a means for switching connected to the first coupler to open in response to the control signal to inhibit power from the source from being supplied to the appliance.

36. A retrofit plug adapted to be received by an appliance that receives power from a
25 source, the retrofit plug comprising:

a live pin;

a neutral pin;

a first line connected to the live pin;

a second line connected to the neutral pin;

30 a first slot, connected to the first line, for receiving a pin from the appliance;

a second slot, connected to the second line, for receiving a neutral pin from the appliance;

- a transformer connected to monitor the first and second lines;
- a measurement circuit connected to the transformer for measuring current supplied to the appliance; and
- 5 a power line carrier transceiver for encoding a power line carrier signal based on the measured current.

PCT/EP2016/062006